Sunstone Weld Head User Manual

WH2 - Parallel Models

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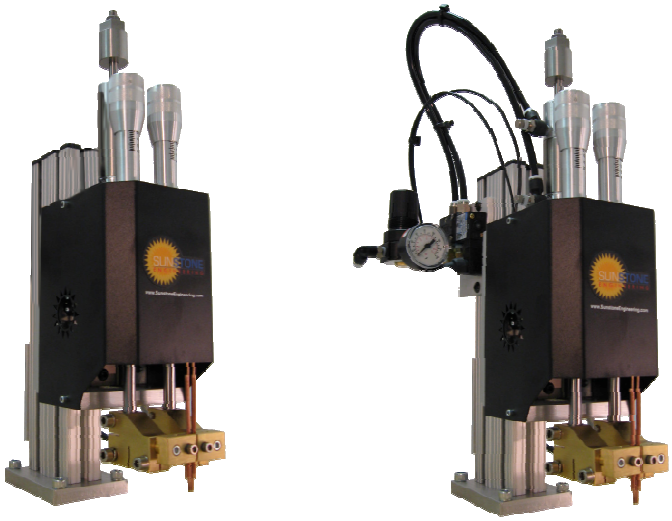

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Parallel Weld Head 12 Quick Start Steps

Pneumatic Versions:
Steps 3, 4 & 5

5. Regulator
Adjust gauge to 30-60 PSI

10. Adjustable Stop-Nut
Adjust for stroke length & switch actuation.

Anti-Rotation Slot: Lubricate w/ Teflon grease every 500,000 cycles.

3. Air Inlet
Attach to Air Compressor.

4. 110 V AC Power Cord
Plug in to 3 prong Foot Pedal & then to the wall.

Ball Bearings:
Lubricate w/ Teflon oil every 2 million cycles.

11. Switch Viewport
View switch actuation as set by height & stop-nut.

12. Pressure Adjust Knobs
Adjust to desired electrode pressure.

9. Height Adjust Lever
Set the Weld Head height close to the work-piece.

8. Electrodes
Adjust position to desired location.

7. Switch Cable
Attach the 3 pin connector to the back of the welder.

6. Weld Cable Hookup
Attach to Welder Terminals.

***1. Base Plate**
Bolt to the table.

2. Manual Versions:
Drill Holes for chain & Foot Pedal. Bolt lever behind Weld Head. Attach chain.

**Note: Follow Set-up Steps in Order*

Series (Parallel) Weld Heads Datasheet

1) Manual Series **2) Pneumatic Series**

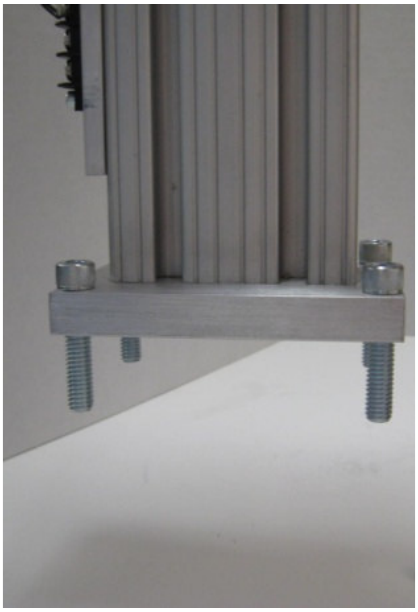
Feature	**Unit of Measure**		
Model		**Manual**	**Pneumatic**
Actuation		Manual Pedal	Air
Weld Force - Standard	lbs.	1.0 – 8.0	1.0 – 8.0
Weld Force – Heavy Duty	lbs.	3.0 – 21.0	3.0 – 21.0
Max. Rating	Watt-Sec.	600	600
Max. Electrode Stroke	Inches	1	1
Electrode Diameter	Inches	1/8” or 1/4”	1/8” or 1/4”
Electrode Tip Min.		.06	.06
Electrode Configuration		Parallel	Parallel
Electrode Holder Type		Offset	Offset
Electrode Min/Max Gap	Inches	.05/1.5	.05/1.5
Max. Throat Size (HxD)	Inches	8 x 5	8 x 5
Weld Cable Size/Length	AWG/Inch	#2/24	#2/24
Foot Pedal Type		Manual Chain	AC, 3 prong
Air Solenoid Voltage	VAC	110 or 220	110 or 220
Air Pressure for Max. Force	PSI	60	60
Air Cylinder Inside Diam. Bore	Inches	1-1/16”	1-1/16”
Cycle Rate	Full Stroke/Sec.	1	1
Max. Dimensions (including Pneumatics & Base Plate)	Height x Depth x Width (Inches)	21 x 10.5 x 5.5	19 x 10.5 x 9.5
Weight (before packing)	lbs.	18	18

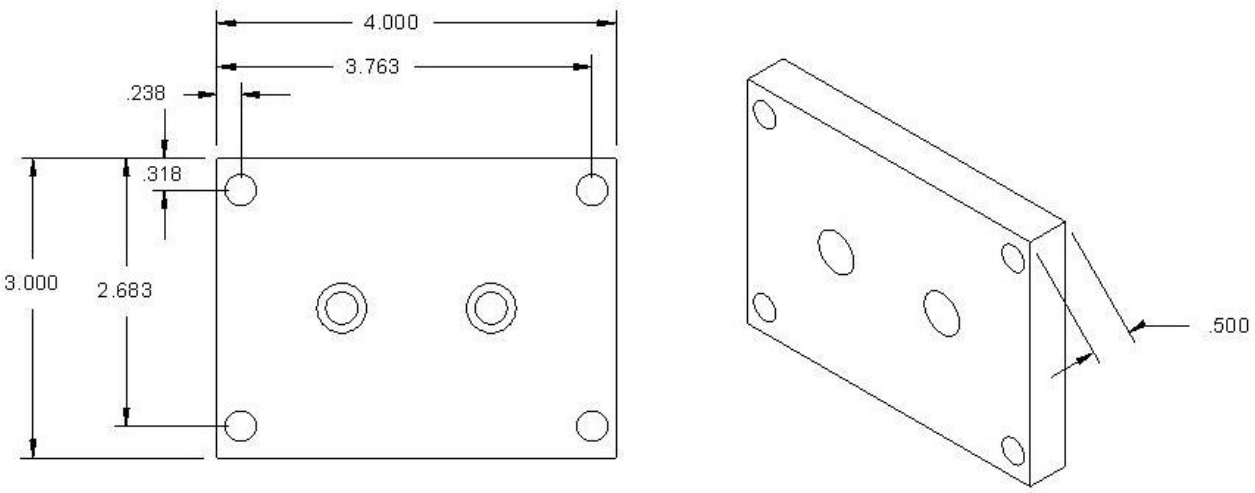
Weld Head Set-Up & Operation:

1) Bolt the Weld Head to the table

A) Use the 5/16-18 x1.5" bolts and the 5/16-18 nuts provided. Use a 1/4" allen wrench to tighten the bolts. Ensure that the Bolts will go through both the Weld Head Base Plate and your table. (If not, you may need to acquire longer bolts or drill & tap the 5/16-18 threads into your table.)

Reference Figure 1: Bottom Mounting Plate with the hole locations for bolting to the table.





***Note: There is also a mounting template available.**

2) Connect the Weld Head to the Foot Pedal.

*Note: This section walks through how to set up the weld head to use a single foot pedal. There is also a Dual Pedal setup option (See page 24 of the manual).

A) Pneumatic Weld Head Versions: Connect the Weld Head to AC POWER. (110 V AC standard, 220 V AC upgrade or Transformer available upon request)

I. Connect the Weld Head Solenoid Valve 110 Volt line to the Foot Switch and then to the Wall Outlet as shown. *Note: a 220 Volt solenoid version is also available.

Figure 2: 110 Volt Weld Head Plug connected to the Foot Pedal & then to the Wall Outlet.

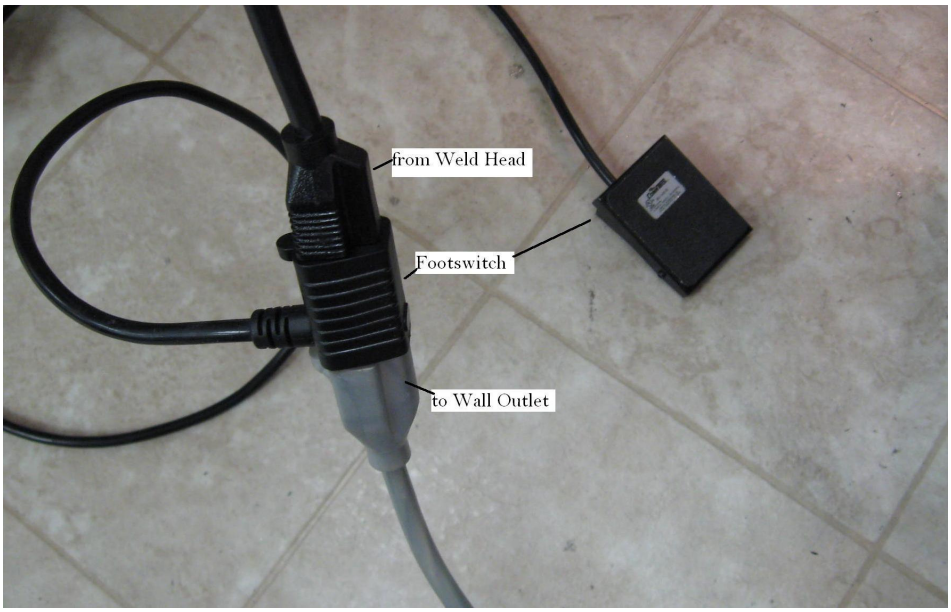
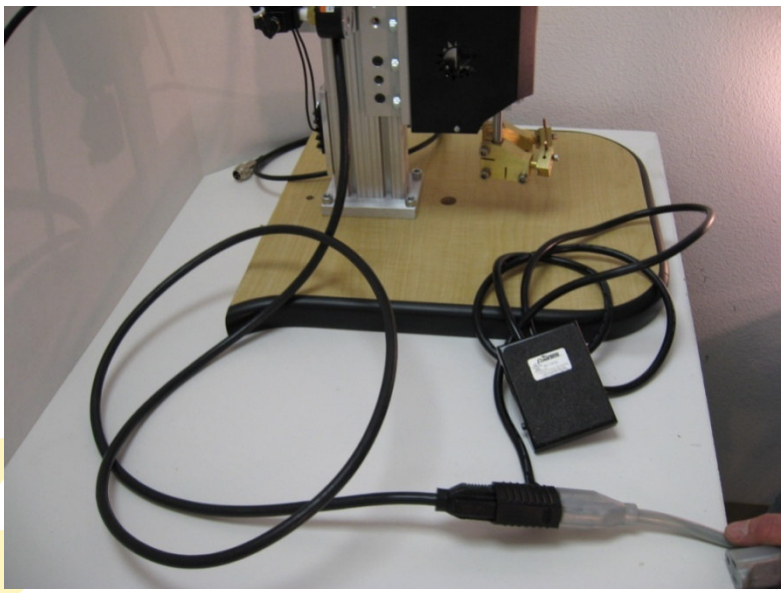


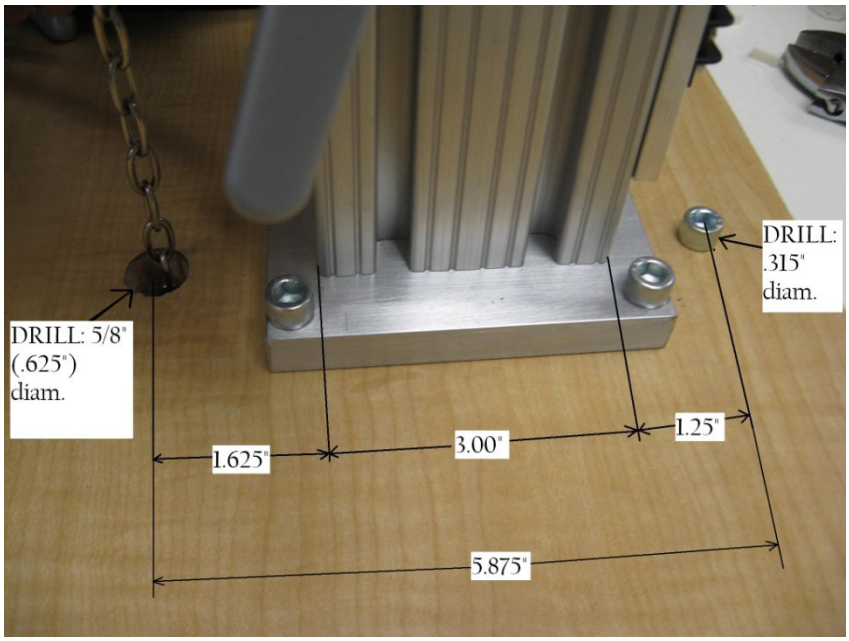
Figure 3: 110 Volt Weld Head Plug connected to the Foot Pedal & then to the Wall Outlet.



B) Manual Foot Pedal Versions: Locate & drill mounting & chain holes, then connect the Weld Head to the Manual Foot Pedal.

I. Locate two holes as shown referenced from the edge of the vertical TSLOT shaft (3" width). Drill the .315" hole BEHIND the weld head 1.25" from the back edge of the vertical TSLOT extrusion. Drill a through hole for the chain (5/8" recommended) approximately 1.625" from the FRONT edge of the vertical TSLOT extrusion. We recommend that you mark the hole locations and remove the Weld Head for drilling.

Figure 4: Drill locations for the weld head chain & Foot Pedal Lever Holder.



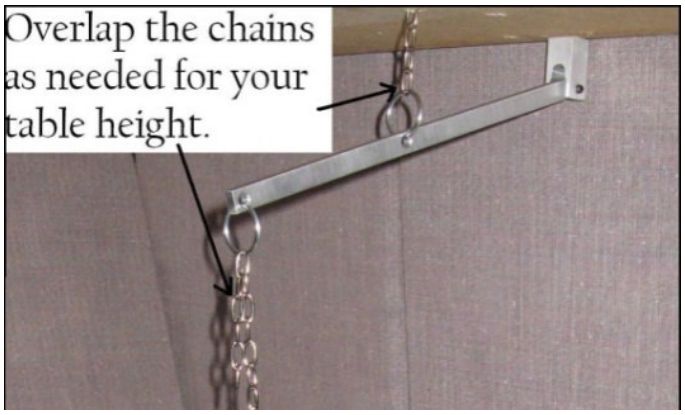
***Note: There is also a mounting template available.**

II. Mount the Manual Foot Pedal to the underside of the table, then to the weld head, & then to the floor.

Figure 5: Manual Foot Pedal Mounted to table: Use the pre-drilled hole behind the weld head and the 5/16-1.5" provided screw to mount the Foot Pedal Lever Holder.

Figure 6: Attach the Weld Head chain: Attach the chain from the Weld Head to the lever arm. NOTE: extra chain is provided—so you may need to determine the appropriate chain link to attach based on the height you desire for your Weld Head. Attach the chain such that when the weld head is in the UP position, the lever arm angle is about 15-20 degrees from the horizontal.

Figure 7: Adjust the Foot Pedal: Adjust the foot pedal chain to the correct height so as to make about a 20 degree angle from the floor.



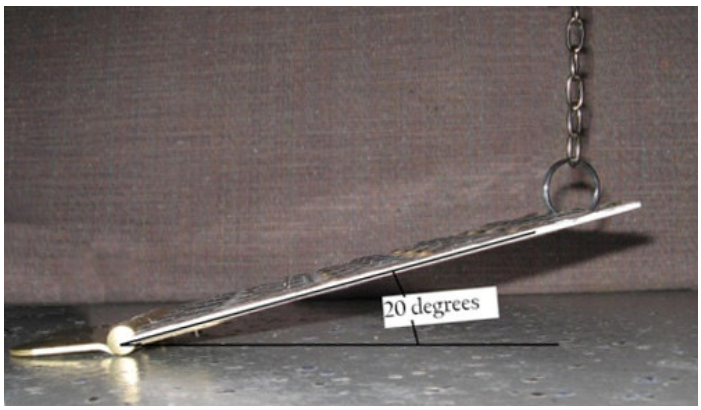
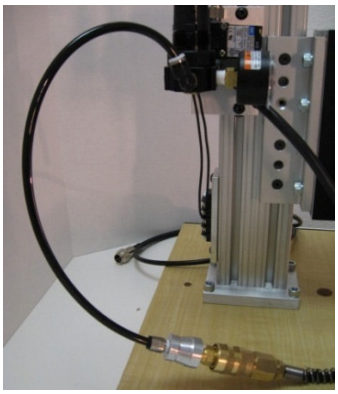


Figure 8: Bolt the Foot Pedal to the Floor or to an alternate floor mount OR Bolt the Foot Pedal to an alternate floor mount.

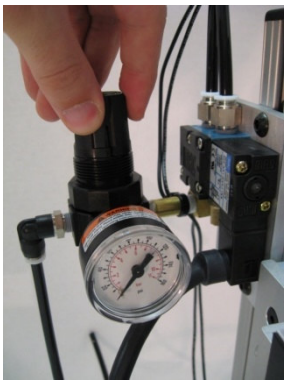
Figure 9: Manual Foot Pedal Correctly Mounted.

3) Pneumatic Versions: Connect the Pneumatic (air) Hose from the Weld Head to your Air Compressor.

A) Figure 10: Use a ¼ inch quick disconnect set-up similar to the figures below.



B) Figure 11: Set the Air Pressure to 30-60 PSI (40 PSI is recommended for most applications). Pull up on the Black Regulator Adjust Knob—Turn clockwise to increase pressure, counterclockwise to decrease pressure. Read the gauge. Push the Black Regulator Adjust Knob back down to lock the desired air pressure setting in place.



C) Figure 12: Adjust the flow control valves on the weld head air cylinder. These valves will determine how quickly the weld head will go up and down. The outside knob adjusts the flow, the inside knob locks the setting in place.

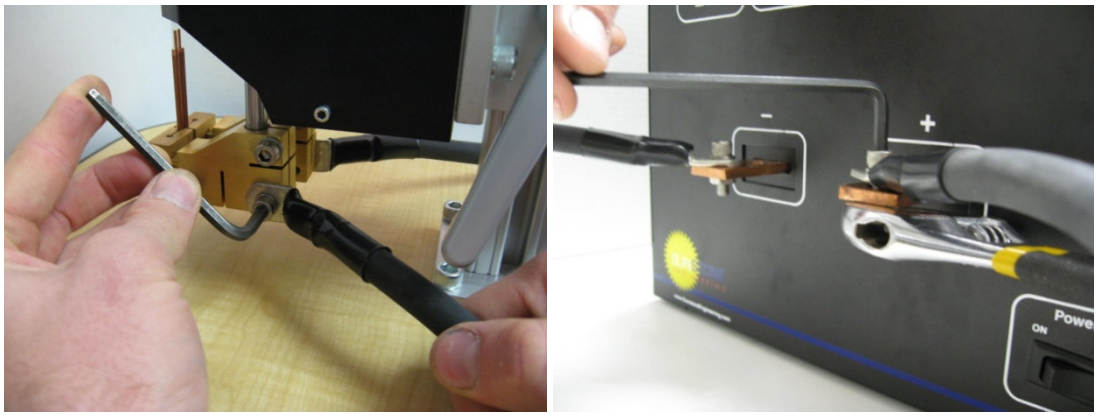
4) Connect the Weld Head to the Welder.

A) Attach the 1 AWG Weld Cable.

I. Bolt the angled side of the Weld Cables to the Electrode Holder Boots with the provided M6x1 bolts.

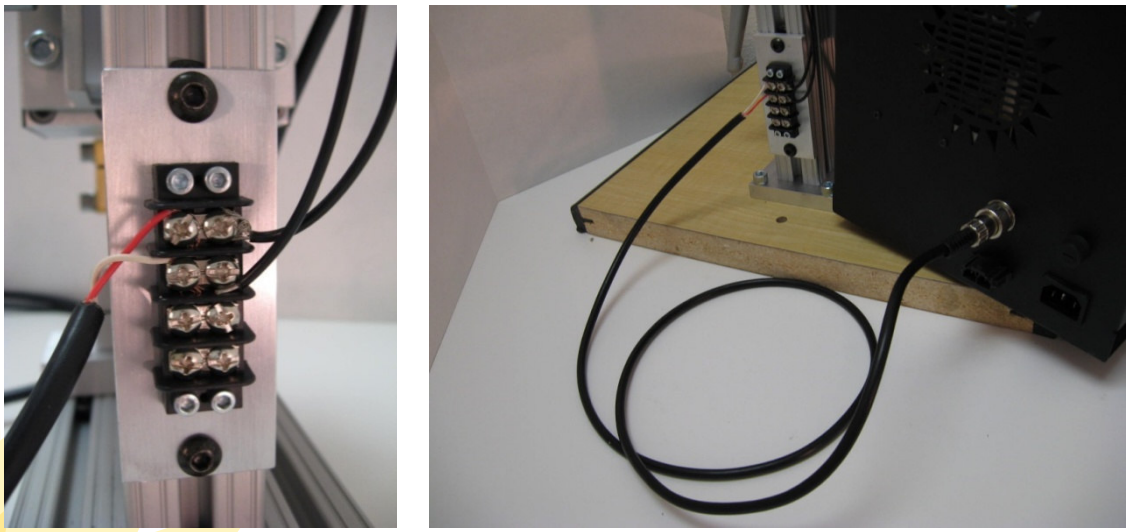
II. Bolt the non-angled side of the Weld Cables to the Welder Terminal Hookups with the provided 1/4-20 nuts & bolts.

Figure 13: Attach the Weld Cable.



B) The weld head connection cable is located on the back of the weld head. It is connected to a terminal block. Connect this cable to the appropriate socket on the Sunstone Welder. Sunstone Weld Heads are compatible with all of our capacitive discharge & AC welders.

Figure 14: Attach the 3 pin weld head cable to the welder.



5) Set up your electrodes as suited for your application.

A) Use 1/8” electrodes.

B) Use 8-32x1/2” screws with a 9/64 Allen Wrench.

I. Adjust your electrode to the appropriate position & height.

II. IMPORTANT: Sand your electrode to remove burrs & ensure precise level tips.

Figure 15: Position the electrodes.

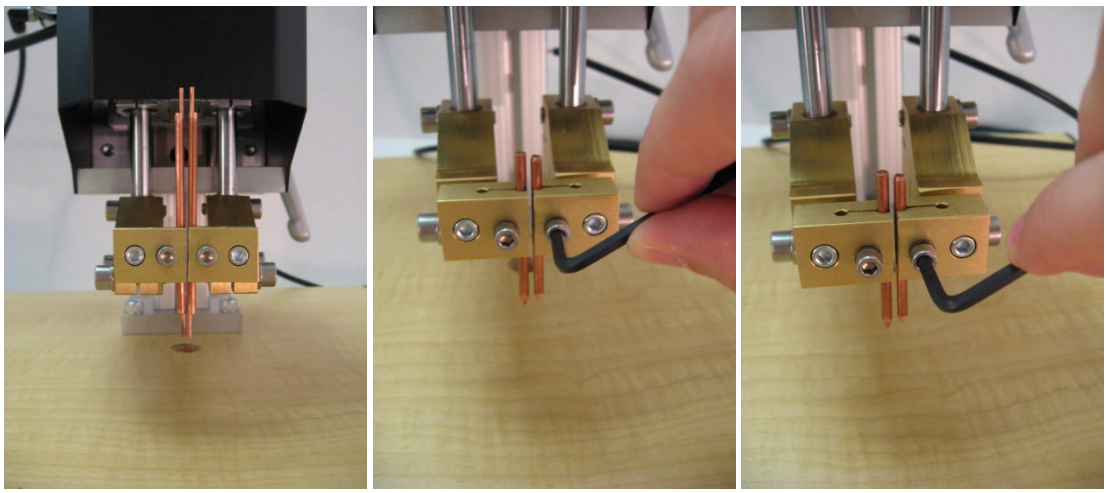
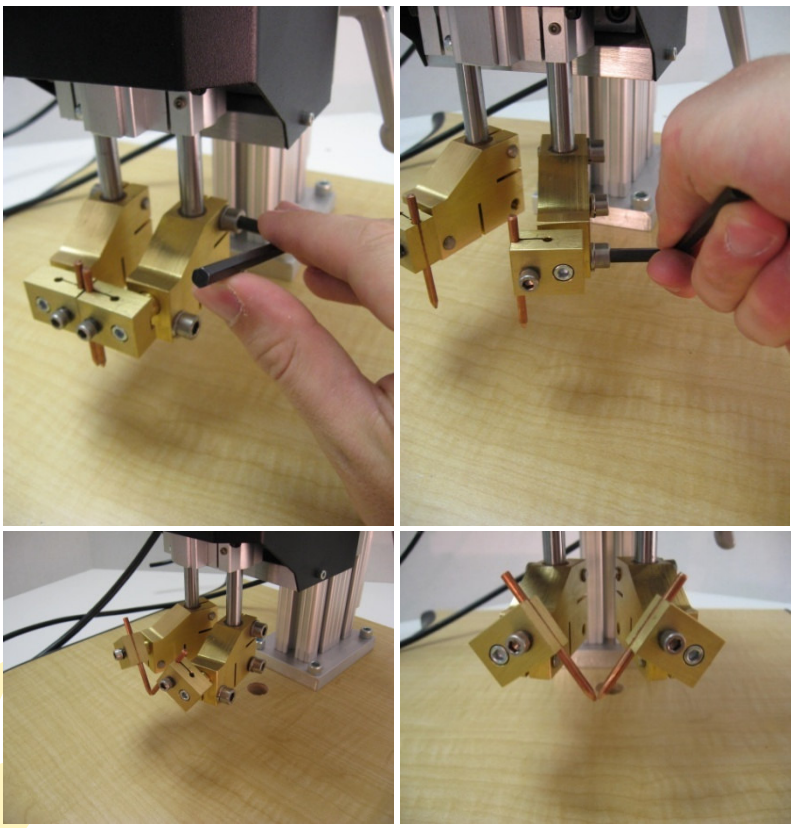


Figure 16: Adjustable options

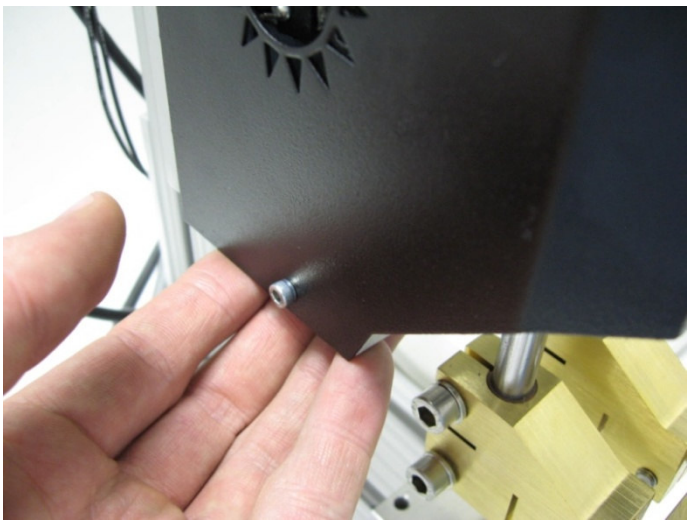


6) Adjust the Weld Head to the appropriate height. (Note: Sunstone Weld Heads are equipped with a 1" internal stroke. Typically, set your electrodes within or less than ¼" of the weld piece. The next step will show you how to use the Stop-Nut to adjust for switch actuation & stroke length.)

A) Use the Weld Head Adjust Handle with your right hand to loosen the weld head position while holding the head with the other hand and raising or lowering it to its desired height.

B) Gently tighten the weld head adjust handle at the desired position.

Figure 17: Height adjust



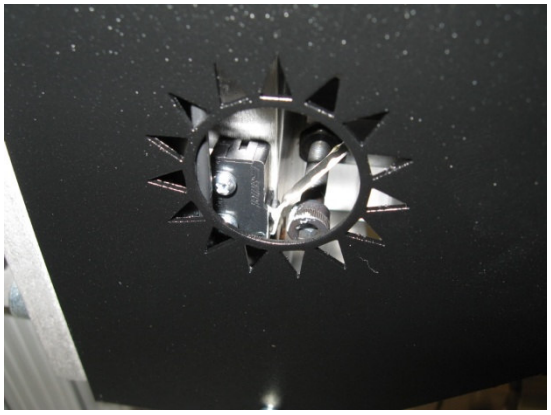
7) Adjust the Stop-Nut for stroke length & switch actuation.

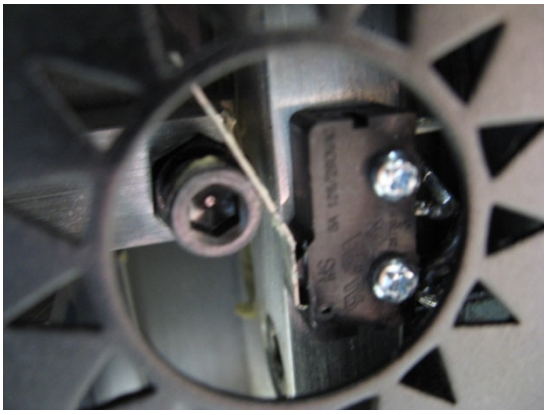
(Do not turn your Welder on yet. Without turning your welder on, some adjustments can be made to ensure proper Weld Head stroke and switch actuation.)

A) Figure 18: Lower the Stop-Nut to reduce the stroke length as desired. A ½" gap will correspond to a ½" stroke.

B) Figure 19: Use the Sunstone view holes located on both sides of the weld head to view the switch(es) actuation. With your welder OFF, press the foot-pedal to lower the Weld Head to the now set stroke length. Notice the switch(es) using BOTH viewports. *The switch will be actuated as the electrodes make contact with the weld piece & follow through to the stroke set by the stop nut.* If your weld head has two switches, both switches must be actuated in order for a weld to be made.

Pre-Actuation of switch **Just Actuated Switch**



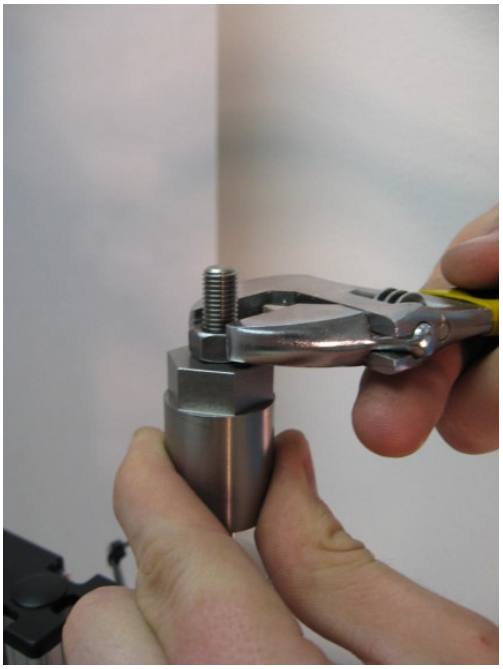


C) If the Stop-Nut is set correctly the screw that actuates the switch should go just beyond the point of actuation. Re-adjust the stop-nut, and press the foot-pedal again to ensure proper switch actuation. Repeat adjustment as necessary.

***Note: Newer models are also equipped with an LED on the top of the Weld Head which acts as a switch actuation indicator.**

Figure 20: Weld Head Actuation (Foot Pedal Depressed): Electrodes are on the work-peice, the Stop-Nut is adjusted to limit the stroke, and the switch is just actuated.

D) Figure 21: Now that the Stop-Nut stroke and switch actuation are set, gently tighten the Stop-Nut with the locking bolt—this will ensure the position you have set. This should be a light duty tightening—as further adjustment for other work pieces will be desired.



8) Adjust the Weld Head Electrode Pressure.

A) These Weld Heads come standard with springs that set the pressure from 3.0 lbs. to 8.0 lbs. on each electrode at the switch actuation point. Other springs are available to increase the pressure up to 21.0 lbs. per electrode. Sunstone Engineering is also developing Weld Head versions with pressure settings below the 1.0 lb. range, and above the 21.0 lb. range.

This chart indicates approximate pressure settings with the standard spring at the switch actuation point:

Light Duty (Standard) Spring Force Settings:

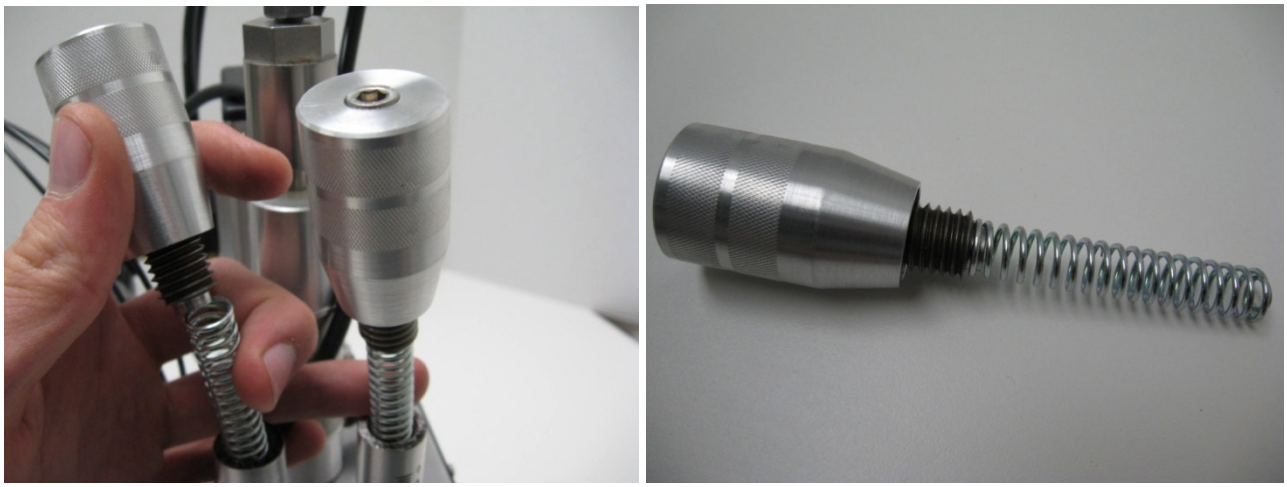
Pressure Setting:	**lbs./ ONE electrode**
0	1.0 lbs.
5	2.5 lbs.
10	4.5 lbs.
15	6.5 lbs.
20	8.0 lbs.

Figure 22: Weld Force adjustment

B) Springs can be easily interchanged by simply unscrewing the knob assembly, pushing on the new spring, and re-inserting the knob assembly. (Note: make sure to acquire springs from Sunstone Engineering that have been rated & modified for your weld head.)

Light duty (standard) springs: These come standard with the 1-8 lb range per EACH electrode. They attach with one end on the nub and the other end that is curled in is oriented down.

Figure 23: Interchanging springs



Heavy duty springs: Can be ordered separately & will allow a 3-21 lb range per electrode. Both ends of the heavy duty springs are curled inward, as such they attach by simply dropping either end of the spring into the shaft hole & putting the knob on. The chart below represents approximate pressure settings with these springs.

Heavy Duty Spring Force Settings:

Pressure Setting:	lbs./ONE electrode
0	3.0 lbs.
5	7.0 lbs.
10	12.5 lbs.
15	17.0 lbs.
20	21.5 lbs.

9) Actuate the Weld

A) Ensure that all previous parameters are set (without turning on the Welder yet):
Refer to the Weld Head 12 Quick Start Steps at the beginning of this manual. After the Weld Head is set up follow these steps prior to performing a new weld.

1. Pneumatic Versions: Adjust the PSI. Set air pressure: 30-60 PSI standard. (Quick Start Step 5).

2. Adjust the Electrode position to desired location. (See section 5 of this manual). (Quick Start Step 8).

3. Adjust the Weld Head Height so the electrodes are close to the work-piece, generally within 1/16" to 1/4". (Quick Start Step 9).

4. Set the Stop-Nut stroke length—it needs to exceed the travel distance of the electrodes to the top of the work piece. (Typical setting Example: 1/4" electrode distance from the work piece should dictate about a 1/2" gap on the Stop-Nut. (Quick Start Step 10).

5. Verify that both switches are actuated when the weld head foot pedal is depressed. (Quick Start Step 11).

6. Adjust the Weld Head Pressure Knobs to the desired EQUAL pressure (for most applications). (Quick Start Step 12).

B) Turn the Welder ON.

1. Turn the Power Switch ON
2. Turn the Pulse Switch ON
3. Adjust to the desired Pulse Level
4. Adjust to the desired Power Level

For battery packs: Typical Settings are: Pulse 1=2.0, Pulse 2=5.0, Power=130-250 Watt-Seconds (depending on application), Air Pressure=40PSI. See Welder Operation Manuals for more information on how to determine appropriate settings.

C) Press the Foot Pedal & make a weld.

1. Press the Foot Pedal: when the switches on the weld head are actuated a weld will be made. Use the viewport to view the switches & simultaneously adjust the Stop-Nut as needed.

2. Adjust the Welder & Weld Head parameters as needed to ensure a proper weld.

Weld Head Maintenance

Bearing Maintenance: Sunstone Weld Heads are equipped with *3 types of bearings* (proper care & maintenance will be described in detail below)*:*

1)Anti-rotation Slot & Slider (requires Teflon WHITE LITHIUM Grease NLGI#2" made by DU PONT, Part No. DGW614101),

2) THOMSON adjustable super pillow block bearings: SPB6ADJ (requires Teflon SILICONE Lubricant made by DuPont Part No. DS0614101),

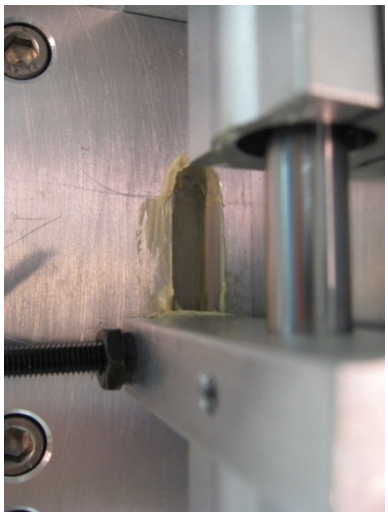
3) Iglide J Housing Bearings: WJUM-01-10 (maintenance & lubrication free)

1) Anti-rotation Slot & Slider: This slot provides anti-rotation for the electrode holders. Slot lube cycle not to exceed 1 year or 500,000 cycles (whichever comes first), but more frequent application may be required based on duty cycle, usage, environment and level of contamination.

EVERY 1 year or 500,000 cycles OR (in dirty environments) sooner as needed the slots need to be dry wiped clean & re-lubricated.

Re-lubricate with "Teflon WHITE LITHIUM Grease NLGI#2" made by DU PONT, Part No. DGW614101 www.teflon.com, www.PerformanceLubricant.DuPONT.com OR from MCMASTER CARR www.mcmaster.com part number: 8708T13. Do not remove the precisely positioned anti-rotation slider to clean out the slot! It can easily be cleaned & re-lubricated without removing the slider as explained in the following steps.

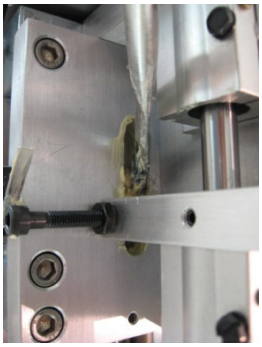
Figure 24: Slot requiring lubrication



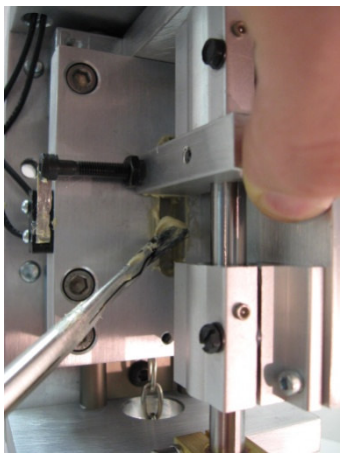
Steps to Re-lubricate the anti-rotation slots:

a) **Figure 25:** Thoroughly wipe clean the old lubrication with a dry rag or paper towel. Do not remove the precisely positioned anti-rotation slider!

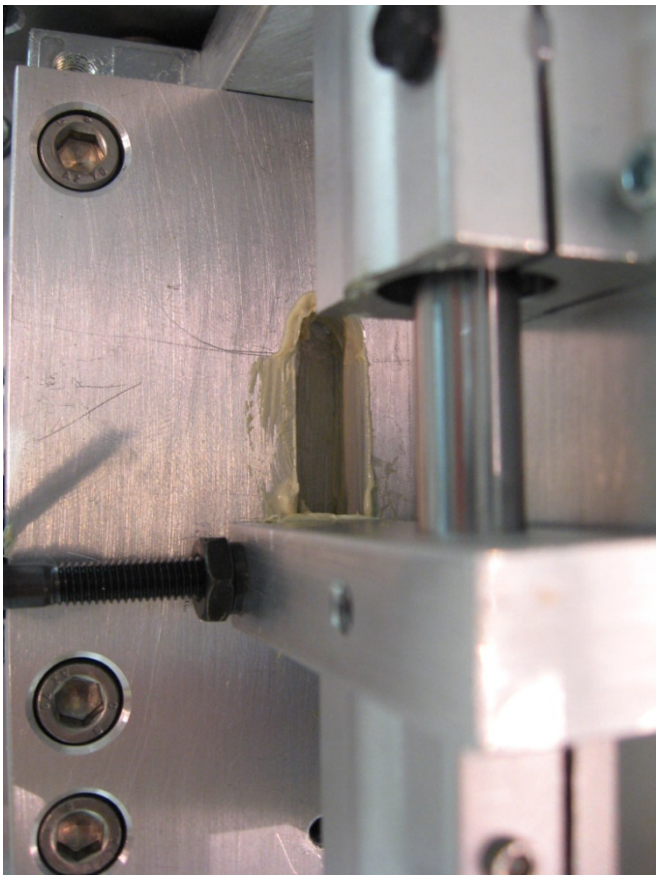
b) **Figure 26:** Liberally Apply Teflon White Lithium Grease NLGI#2 to the upper portion of the slot. Do not remove the precisely positioned anti-rotation slider!



c) **Figure 27:** Liberally Apply Teflon White Lithium Grease NLGI#2 to the lower portion of the slot—lift up the anti-rotation slider with your hands—you may want to retract the spring loaded knobs past the zero mark. Do not remove the precisely positioned anti-rotation slider!



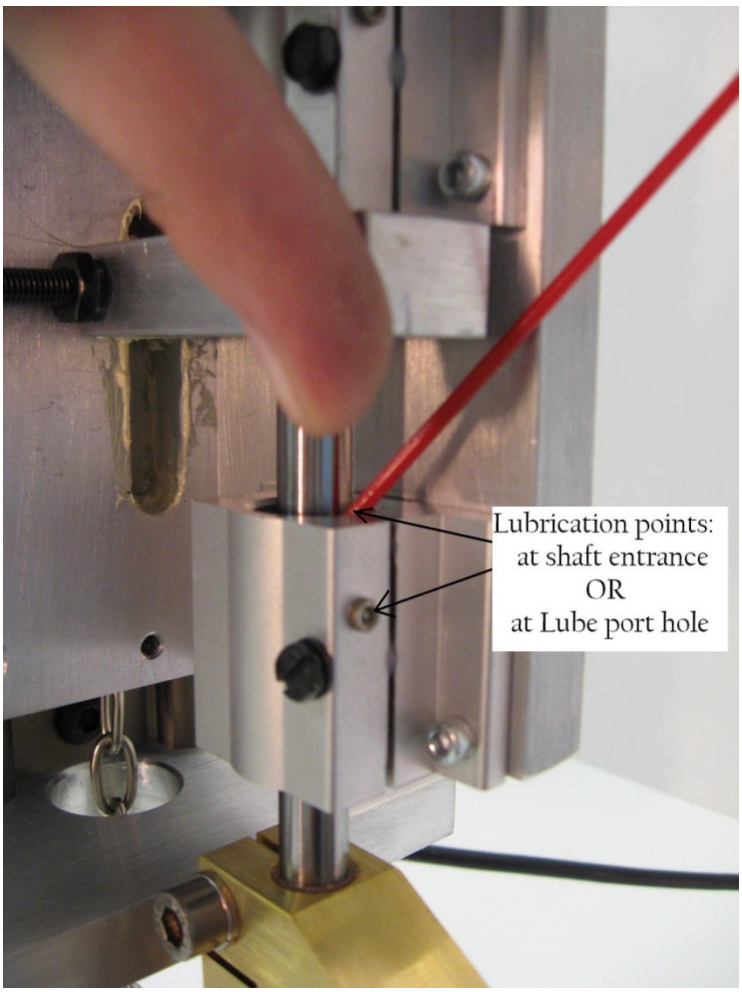
d) **Figure 28:** A newly re-lubricated slot will look like this and will allow a smooth sliding motion.

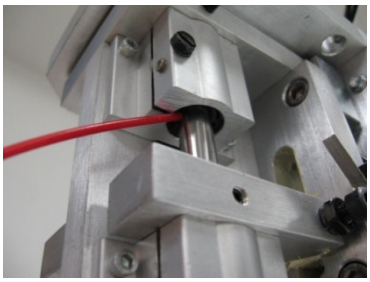


2) Adjustable super pillow block bearings: Bearing lube cycle not to exceed 1 year or 2 million cycles (whichever comes first), but more frequent application may be required based on duty cycle, usage, environment and level of contamination.

Re-lubricate with "Teflon SILICONE Lubricant" made by DuPont Part No. DS0614101 www.PerformanceLubricant.DuPONT.com OR from MCMASTER CARR www.mcmaster.compart number: 8708T13. You can also use LinearLube lubricant that utilizes suspended Teflon in a specially formulated compound provided by Danaher Motion.

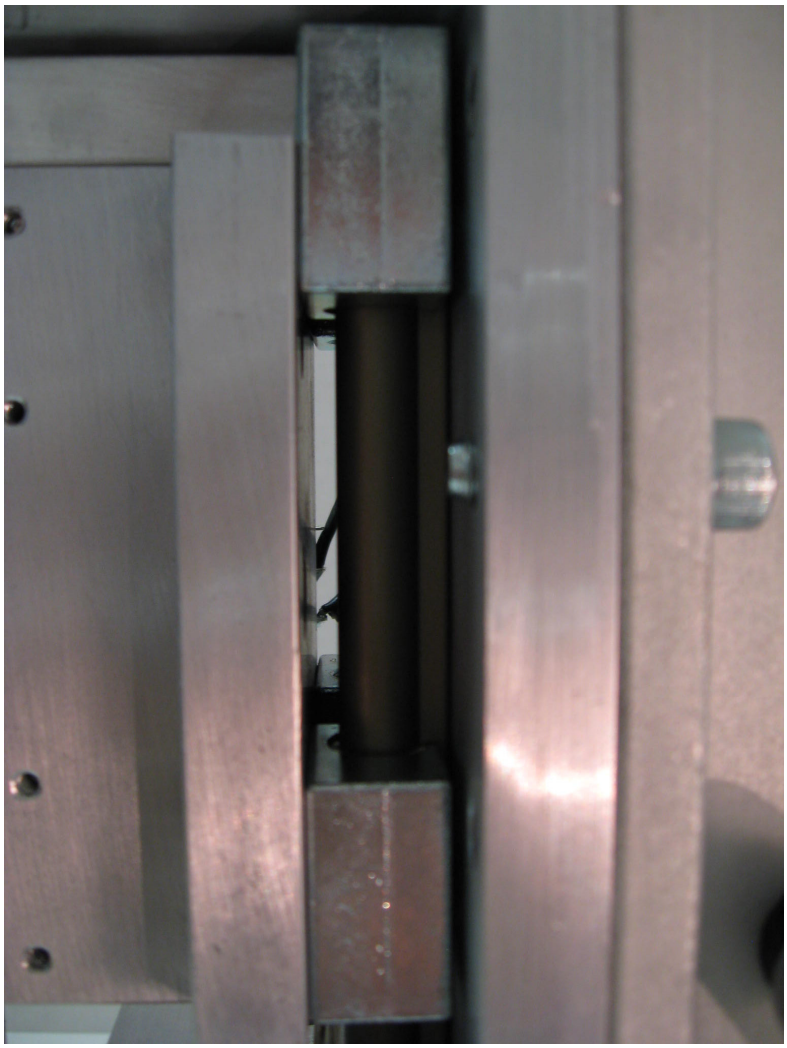
Figure 28: Re-lube the ball bearings





3) Iglide Bearings: These plastic bearings are maintenance free. They do not require any lubrication. For maximum efficiency and wear qualities, keep the Weld Head in a clean environment. Also, do not provide any exterior forces or moments on the Weld Head. In optimal conditions and use they are rated for a lifetime of 50 million cycles.

Figure 29: Iglide plastic bearings do not require lubrication



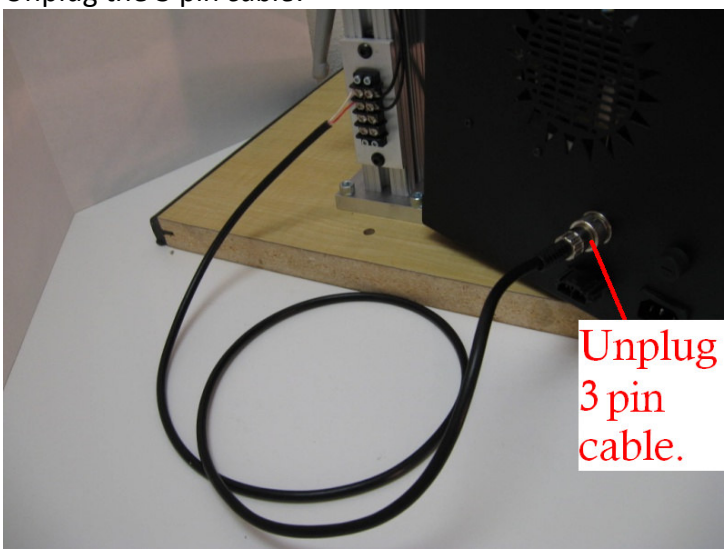
*Note: Some newer models are equipped with an adjustment set screw. Do not adjust this set screw. Contact Sunstone Engineering for factory bearing adjustment.

Electrode Care: Always be sure to clean and sand your electrodes prior to performing welds and after electrode tip wear. More information is provided at www.sunstoneengineering.com. Please see the instructional videos.

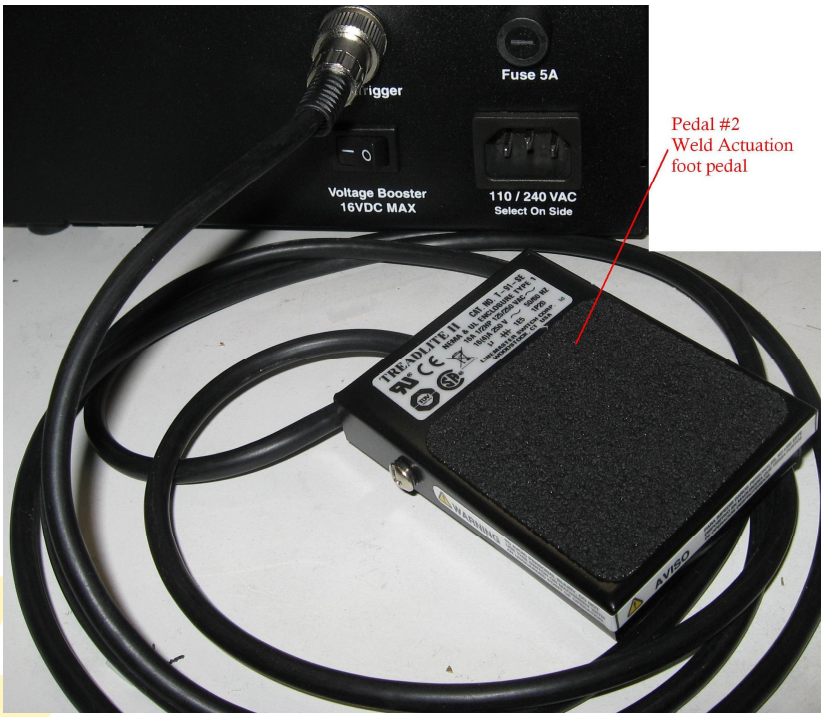
Optional Dual Pedal Actuation Instructions

The weld head can also be actuated by bypassing the switches on the weld head using the 2 foot pedal method described below.

1) Unplug the 3 pin *cable*.



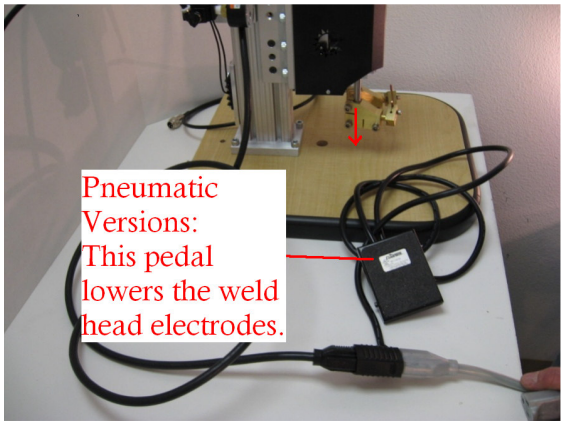
2) Plug in the 3 pin *foot pedal* to the same location that the weld head 3 pin *cable* was unplugged. The cable is the same as the 3 pin cable that you just disconnected from the weld head—except that it is connected to a foot pedal instead of to the weld head.



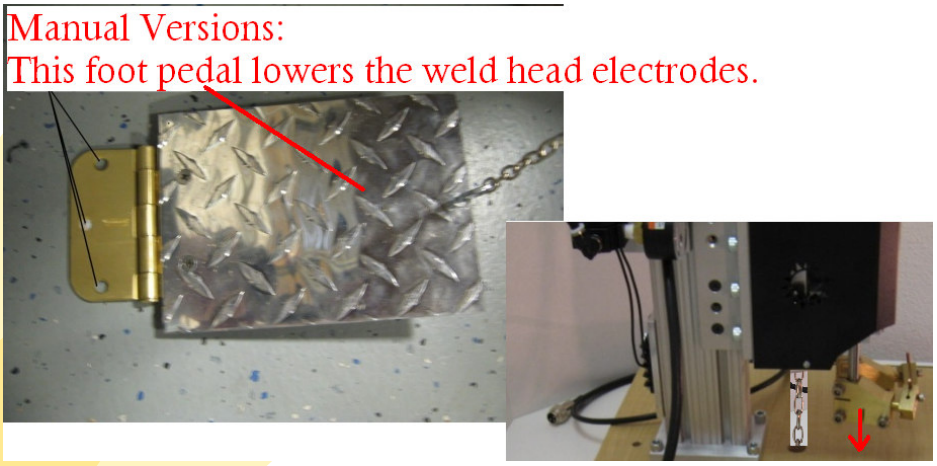
3) Adjust the stop-nut & the pressure setting knobs to an appropriate stroke length & pressure setting for your application.

4) Press ***& hold*** the foot pedal#1 that lowers the weld head electrodes. With the pedal depressed you should see the electrodes lower onto the work-piece to be welded.

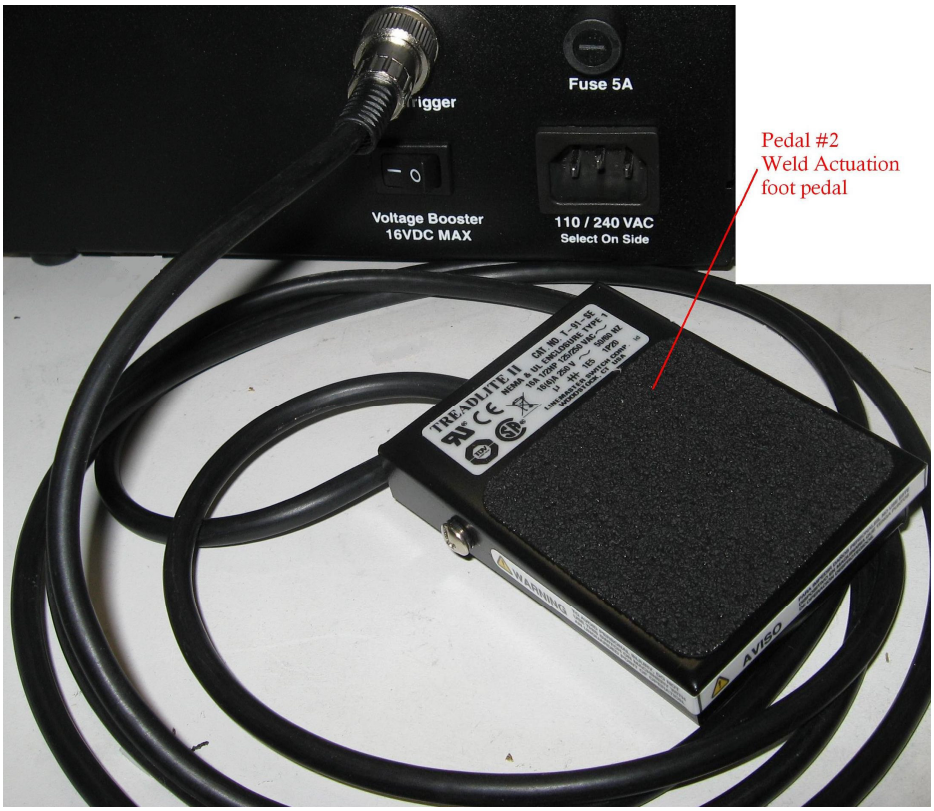
PNEUMATIC FOOT PEDAL#1 – Lowers the weld head:



MANUAL FOOT PEDAL#1 – Lowers the weld head:



5) With the foot pedal#1 that lowers the electrodes STILL DEPRESSED—use PEDAL#2 to ACTUATE THE WELD by now pressing the foot pedal that is plugged into the back of the welder.



Process explanation:

- The ***first foot pedal is pressed*** to lower the weld head ***& is held down*** so that the electrodes continue to apply pressure to the work piece to be welded.

- The second foot pedal is pressed after ***the first pedal is depressed & held down*** & thus sends a signal to ACTUATE THE WELD.

- The advantages with this dual pedal method are:

    1) The user has more control to ensure that the setup is correct prior to actuating the weld.
    2) The user also has the ability to decide exactly when the weld is actuated.
    3) For troubleshooting to verify that the signal to actuate the weld is sent properly.

Thank you for choosing

Sunstone Engineering

Please feel free to contact us with any questions you may have at (801) 658-0015.

Sunstone Weld Head User Manual

Parallel (WH2) Models

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